

July 19, 2000
File No. 32219.14-C

Ms. Rebecca Fishman
U.S. Environmental Protection Agency
One Congress Street, Suite 1100
Boston, Massachusetts 02114-2023

Re: Surface Emission Monitoring Report - First Quarter 2000
Central Landfill
Johnston, Rhode Island

Dear Ms. Fishman:

The purpose of this letter is to provide you with the results of the first quarter of surface emission monitoring at the Central Landfill in Johnston, Rhode Island. GZA GeoEnvironmental, Inc. (GZA) has completed initial monitoring of all areas of the landfill with the exception of areas of active landfilling and/or construction. Our work was conducted on behalf of the Rhode Island Resource Recovery Corporation (RIRRC). The following sections discuss our overall observations of landfill gas surface emissions, details of the monitoring program, and response actions completed and proposed to remediate areas with detected elevated surface emissions.

INTRODUCTION

Subpart WWW of 40 CFR Part 60.750 requires that surface emission monitoring be completed quarterly. The first quarter of monitoring commenced on April 13, 2000 and was completed by GZA in May 2000. Completion of the first quarter of monitoring was delayed due to changes in the program approach, sampling methods, and adverse weather conditions. We believe that the knowledge gained during the first quarter of monitoring has resulted in improved implementation of the program and a better understanding of surface emissions at the site. The second quarterly round of surface emission monitoring commenced on June 27, 2000 and was completed by July 7, 2000, thereby resulting in two rounds completed in the first half of this year.

MONITORING RESULTS

The attached Figure 1 shows the surface monitoring routes completed by GZA and the locations at which levels of methane exceeded 500 parts per million (ppm). In general, the exceedances occurred in areas where there is no final cap. As expected, capturing and controlling landfill gas in these areas is more difficult than in areas where final caps and final landfill gas collection systems are installed.

The first quarter of monitoring was completed over portions of 8 non-consecutive days. Surface methane emissions were detected above 500 ppm at 31 locations as shown on Figure 1. Elevated surface methane emission concentrations ranged from 600 ppm to 99,200 ppm. Table 1 summarizes the results of the surface emission monitoring. It should be noted that elevated readings in or emanating from gas collection wells or associated structures were not recorded since they are not subject to this monitoring requirement.

A review of the monitoring data resulted in the identification of four general areas that required improved landfill gas control. Our response actions to the elevated readings are designed to reduce surface emissions in these broad areas that include all the identified points of exceedances. An example of this approach is that elevated surface emissions were detected throughout the area where the RecoverMat operations are located, shown as Area 3 on the Figure 1. Our response to the detected surface emissions in this area included the installation of multiple landfill gas collection trenches. The entire area will be re-monitored following completion of the trenches to evaluate if the trenches are effective in reducing surface emissions in this area. Further explanation of our response actions in other areas of elevated surface emissions is provided in the following section.

Due to the level of surface emissions detected and the extent of the areas of emissions, it was determined that repair of cover or minor adjustments to the existing collection system would not generally be sufficient to reduce the surface emissions to acceptable levels. Therefore, we have assumed that three exceedances within thirty days would have been detected in these areas and RIRRC and CGLP have moved directly to making improvements in the collection system and cover materials in these areas. Subpart WWW allows 120 days for the installation of new extraction wells and other significant improvements to address locations where exceedances were detected on three consecutive 10-day monitoring events. As described below, some of the improvements deemed necessary by RIRRC and CGLP to reduce surface emissions to acceptable levels have been completed and the remainder are in the process of being completed. All attempts will be made to complete the improvements by August 25, 2000 (120 days following completion of the field monitoring).

RESPONSE ACTIONS

In accordance with 40 CFR, Part 60.755(c)(4)(v) RIRRC, in concert with CGLP, will be undertaking the response actions described here. Note, that the majority of these actions involve the installation of new collection wells and/or collection trenches which do not require prior regulatory approval under 40 CFR, Part 60.755(c)(4)(v). We have also identified the need to upgrade some portions of the collection system header piping to improve vacuum levels to the wells and trenches. 40 CFR, Part 60.755(c)(4)(v) states that these types of actions require EPA approval; however, because the pipe upgrades are deemed necessary regardless of the SEM results RIRRC and CGLP have proceeded with these system improvements at their own risk.

Based on the surface emission monitoring results, vacuum levels recorded by CGLP in collection wells, and field observations, it is apparent that the performance of the collection system must be improved (i.e., increased cover material alone will not reduce surface emissions if the subsurface pressure of the landfill gas is not relieved). As discussed in the following paragraphs, GZA, RIRRC, and CGLP identified numerous actions to be completed to reduce surface emissions in these areas.

The first area of concern identified is the northern portion of the Phase II landfill shown as Area 1 on Figure 1. Three actions have/will be completed in this area to reduce surface methane emissions: 1) upgrading of piping in the collection system; 2) installation of additional landfill gas extraction wells; and 3) placement of low permeability soil over the area. As shown on Figure 2, the central manifold pipe in the collection system in this area is currently a combination of 4-inch and 8-inch diameter high density polyethylene (HDPE). Due to the low vacuums detected in collection wells in this area, the 4-inch diameter pipes will be replaced with an 8-inch diameter pipe. Additionally, the collection pipe passes through a 4-inch diameter connection that will be removed as part of these improvements. These actions should increase the vacuum of the collection wells and

have been completed.

Two additional extraction wells will be installed, as shown on the Figure 2, by August 25, 2000 (i.e., 120 days from the measured exceedances). These wells will likely be screened closer to the surface than existing wells in this area based on the hypothesis that landfill gas is now being generated from the near surface waste more recently placed in this area. GZA and CGLP are currently evaluating this hypothesis through the installation of multi-level gas monitoring probes. During the installation of these monitoring probes, GZA observed perched water at shallow depths within the waste. This information was reported to CGLP representatives, who then measured water levels within the LFG extraction wells along the western and southern slope of the Phase II/III Landfills. The measurements, which are reported on Table 2, indicate that a number of these wells are inundated. RIRRC and CGLP are in the process of pumping out the submerged wells to improve their collection efficiency. This action alone should significantly improve the capture of gas along the northwestern slope. The need for additional new wells on the western and southern slopes of Phases II/III will be evaluated after the perched water is removed.

A 6-inch layer of low permeability soil is currently being placed over this area. The low permeability soil should increase the effectiveness of the landfill gas extraction wells in this area. A 6-inch layer of compost and plantable soil is also being placed over the low permeability soil and seeded to provide vegetative cover to prevent soil erosion and stabilize the slope.

The second area of concern is located on the southern portion of the Phase II Landfill. As shown on Figure 1, most of the exceedances were detected along the western end of the previously installed cap. To increase the vacuum levels in the extraction wells in this area, the central collection manifold pipe will be upgraded from 6-inches to 12-inches in diameter and another 4-inch diameter branch connection will be removed as shown on Figure 2. The increased vacuum in the wells resulting from these improvements should reduce the surface emissions in this area. These actions will be completed by August 20, 2000. Several inundated wells were also identified in the vicinity of the measured SEM exceedances. RIRRC and CGLP will be taking similar remedial efforts in this area to address the water problem and expect similar positive results.

As discussed previously, the area in which the RecoverMat operations are located (Area 3) is an area of concern. Due to the high methane levels detected relatively flat slope and need to fill over this area, it was decided that collection trenches would be the most effective method to control surface emissions. Installation of a series of five collection trenches commenced on May 1 and was completed on June 20, 2000. Gas is currently controlled by Remote Flares 2 and 3. Figure 2 shows the configuration of the new collection trenches. The effectiveness of this completed action is being evaluated and will be discussed in the second quarterly monitoring report.

The fourth area identified, as shown on Figure 1, is the area on the southwest corner of the Phase II and Phase III Landfills along the toe of slope. The improvements completed in Area 3, as well as the remediation of existing inundated wells, should reduce the gas pressure and associated surface emissions from this area. Due to the distance between existing gas extraction wells in this area, four additional wells will be installed as shown on Figure 2. The new wells will be completed by August 25, 2000. The need for more wells will be assessed after these remedial actions are complete.

RECOMMENDED IMPROVEMENTS TO MONITORING PROGRAM

We are aware that implementation and documentation of this monitoring program requires improvement. Starting with the second quarter of monitoring, the following improvements will be

initiated. First, although not required by Subpart WWW, our existing plan includes notifying the USEPA within seven days of detected exceedances. In general, during the first round of monitoring, we assumed that the presence of USEPA personnel on-site at times when exceedances were detected fulfilled this requirement. However, the USEPA was not notified within seven days of detected exceedances when representatives of USEPA were not present. Within seven days after detecting an exceedance, a field summary report with recorded exceedances, a figure showing the general location of the exceedances, and a brief cover letter will be faxed to the appropriate USEPA representative, RIRRC, CGLP, and Dufresne-Henry. The locations of the exceedances will be surveyed and located on a figure to be included in the quarterly report.

Second, we will generally complete the monitoring in a shorter time period. We estimate that the monitoring requires five to seven person days to complete. We will attempt to perform the monitoring on as many consecutive days as possible. Please recognize however that adverse weather, equipment malfunction, and/or personnel availability may prohibit completing the monitoring on entirely consecutive days.

Lastly, Subpart WWW requires documentation of all calibration of equipment and certification of calibration gases. Although we have been completing the calibration procedures in accordance with Subpart WWW, the calibration procedures have not been consistently documented. The attached calibration logs will be completed each day prior to the start of monitoring. The calibration logs will be submitted to the USEPA as part of the quarterly report. Calibration gas certifications will also be submitted in the quarterly reports.

We trust this letter fulfills your current needs. If you have any questions or comments regarding this information please feel free to call either of the undersigned at (401) 421-4140 or contact us via email at esummerly@gza.com or junsworth@gza.com.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

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Attachments: Figure 1 (CLFBASE\32219-14\32219-14.DWG, LAYOUT MON)
Figure 2 (CLFBASE\32219-14\3221914WF, LAYOUT WELLFIELD)
Tables 1 & 2
Calibration Log

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TABLE 1

**SUMMARY OF SURFACE EMISSION
MONITORING
FIRST QUARTER 2000**

Central Landfill - Johnston, Rhode Island

Area of Concern	Location I.D.	Methane Concentration Detected (ppm)
Area 1	Q100-1	4,526
	Q100-2	3,545
	Q100-3	5,126
	Q100-4	2,819
	Q100-5	1,379
	Q100-6	7,315
	Q100-7	4,250
	Q100-8	585
	Q100-9	2,217
	Q100-10	2,508
	Q100-11	1,769
	Q100-12	24,200
	Q100-13	713
Area 2	Q100-14	2,370
	Q100-15	99,200
	Q100-16	11,100
	Q100-17	9,320
	Q100-18	1,458
	Q100-19	6,174
	Q100-32	3,000
	Q100-33	1,200
Area 3	Q100-20	96,200
	Q100-21	66,700
	Q100-22	1,446
	Q100-23	840
	Q100-24	81,100
	Q100-25	70,300
	Q100-26	Flameout
	Q100-27	83,800
	Q100-28	981
Area 4	Q100-29	873
	Q100-30	752
	Q100-31	1,700

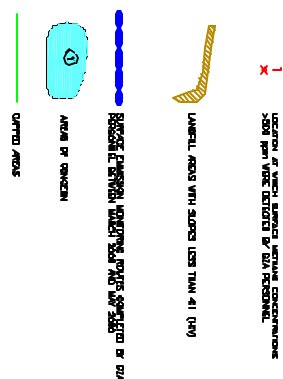
TABLE 2

**SUMMARY OF DEPTH TO WATER
IN LANDFILL GAS EXTRACTION WELLS**

Central Landfill - Johnston, Rhode Island

Well ID	Depth to Water (feet)	Depth of Well (feet)	Standing Water (feet)
18	3	62	59
19	23	55	32
21	6	60	54
42	17	40	23
43	44	39	-5
44	26	40	14
45	9	38	29
46	5	45	40
47	27	48	21
48	33	75	42
52	26	81	55
53	12	75	63
54	28	86	58
56	42	81	39
57	23	65	42
58	20	55	35
17	50	59	9
59	7	52	45
38	21	60	39
39	15	55	40
40	17	45	28
41	44	42	-2
60	25	95	70
61	28	97	69

Note: Water depths referenced from top of well casing which may be 2 feet to 10 feet above the ground elevation. Negative values indicate well is dry and negative amount is equal to height of well casing above grade.



LEGENDA

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LOCATION AT WHICH SURFACE ACTUAL CONCENTRATION
>500 PPM WERE DETECTED BY GZA PERSONNEL.



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